

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Saturday-January 01, 2005: MS-034, Yellow Quench: File# = 1104564705***

Permit ID: 8b-ps1      Timestamp: 02:31:44 +1009710      Beam Permit Fail Timestamp: 02:31:44 +1009740

QPAControl / Timing Resolver: QPA Control, QP03-R8BQT3-yi7-tq5-qp, with an OVC fault.

Quench Detector(s) Trip: 8b-qd2; Y8QFQ2\_VT Int. 1, Tq= -24

5 Minute: Quench Delay File: (8b-qd2), Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr): High Levels near Sector 8 Triplet:

y8-lm2.1 = 46134.57 for over 1 second, y8-lm3.1 = 2734.45 and b8-lm2.1 = 45016.52

Main Magnet Power Status: Store Energy

**Technical Notes / Sequence of Events:** High level of beam in Sector 8 Triplet along with the analysis of QD Plot, confirms that Y8QFQ2\_VT of the q2 magnet had indeed suffered a beam induced quench. [G. Heppner](#)

**Physics Summary:** We had 3 ramps this shift, 2 successful, 1 unsuccessful (with 25  $10^9$ ). Chromaticity on the ramp were measured again and adjusted (seems that they changed or drifted again after Todd applied correction last night). We lost most of the night on 3 yellow QLI's and at the end of the shift we are waiting for CAS to swap out a QPA in the yo8-qf2 power supply. We had problems with radial steering (Nick tried and blue started de-bunching progressively). Collimators were moved in and commissioning started (some pin diodes are not yet available and some are still suspicious -- Tony Curcio is working on that). Gap cleaning was done at the "end of store" successfully. In the last ramp we had bad yellow lifetime at store (though that was ok in the two flattops before). We did not try to contact RF for re-bucketing nor did we have time to try cogging (due to QLI's). -ad

QLI Recovery TAPE Start: 03:00:43      Link Recovered Time: 03:09:43      Estimated Down Time: 38 minutes

**Quench Analysis: Beam Induced Quench**

**(Counter = BI #004)**

***Saturday-January 01, 2005: MS-035, Yellow Quench: File# = 1104570022***

Permit ID: 8b-ps1      Timestamp: 04:00:20 +2930067      Beam Permit Fail Timestamp: 04:00:20 +2930097

QPAControl / Timing Resolver: QPA Control, QP03-R8BQT3-yi7-tq5-qp, with an OVC fault.

Quench Detector(s) Trip: 8b-qd2; Y8QFQ2\_VT Int. 1, Tq= -24

5 Minute: Quench Delay File: (8b-qd2), Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr): High Levels near Sector 8 Triplet:

g8-lm1 = 2890.94, y8-lm2.1 = 46123.29 for over 1 second, y8-lm3.1 = 4580.99 and b8-lm2.1 = 44848.88

Main Magnet Power Status: Store Energy

**Technical Notes / Sequence of Events:** High level of beam in Sector 8 Triplet along with the analysis of QD Plot, confirms that Y8QFQ2\_VT of the q2 magnet had indeed suffered a beam induced quench. [G. Heppner](#)

Physics Comment: 04:04: We were not doing anything when the quench occurred (?!). -ad

QLI Recovery TAPE Start: 04:30:42      Link Recovered Time: 04:39:55      Estimated Down Time: 40 minutes

**Quench Analysis: Beam Induced Quench**

**(Counter = BI #005)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

***Saturday-January 01, 2005: MS-036, Yellow Quench: File# = 1104579582***

Permit ID: 8b-ps1      Timestamp: 06:39:40 +2234297      Beam Permit Fail Timestamp: 06:39:40 +2234327

QPAControl / Timing Resolver: QPA Control, QP03-R8BQT3-yi7-tq5-qp, with an OVC fault.

Quench Detector(s) Trip: 8b-qd2; Y8QFQ2\_VT Int. 1, Tq= -24

5 Minute: Quench Delay File: (8b-qd2), Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr): High Levels near Sector 8 Triplet: Y8-lm0 = 2645.95 g8-lm1 = 4123.62, y8-lm2.1 = 46123.29 for over 1 second, y8-lm3.1 = 2652.42 and b8-lm2.1 = 45000.03

Main Magnet Power Status: Store Energy

**Technical Notes / Sequence of Events:** High level of beam in Sector 8 Triplet along with the analysis of QD Plot, confirms that Y8QFQ2\_VT of the q2 magnet had indeed suffered a beam induced quench. [G. Heppner](#)

[05:20](#) We reload the loss monitor thresholds to the Loss Monitor Threshold application. -LH

[05:35](#) We receive a quench link interlock indication from bo2-tq6. We work to revive the power supply. -LH

[06:46](#) We were doing local orbit bumps at this time (sector 7), however, I don't think that the QLI has anything to do with this (we took another orbit measurement after the bump was applied and there were no losses or lifetime changes). -ad

[06:53](#) After three quenches, all-originating from 8b-ps1, we call Don Bruno to help with diagnosis. The quenches, although they all are accompanied by losses, seems suspicious, since at least one of them occur even with no changes in the ring, and the latest occurring well after ramping was completed. -LH

[07:59](#) Don has CAS swapping the QPA in the offending power supply. -ad

[08:44](#) CAS has swapped out the QPA for yi7-tq5. We are now bringing up the quench link. -NAK

[08:48](#) Don and George are unable to connect from offsite using VPN. C. Peters is consulting a technician from ITD to try to resolve the problem. -NAK

QLI Recovery TAPE Start: 08:43:59      Link Recovered Time: 08:53:07      Estimated Down Time: 133 minutes

***Quench Analysis: Beam Induced Quench***

***(Counter = BI #006)***

***Sunday-January 02, 2005: MS-037, Blue Quench: File# = 1104668508***

Permit ID: 3b-ps1      Timestamp: 07:21:48 +269342      Beam Permit Fail Timestamp: 07:17:12 +1547596

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 3b-qd1, B2DSA4\_A3VT Int. 100, Tq= -24

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): No Beam in the machine.

Main Magnet Power Status: Ramping down from LastStone, tripping at BMD = 497 amps, BMQ = 467 amps.

**Technical Notes / Sequence of Events:** Engineers had trouble logging into the systems from home. Refer to MS-039 for further details.

QLI Recovery TAPE Start: 08:13:37      Link Recovered Time: 08:20:59      Estimated Down Time: 55 minutes

***Quench Analysis: Quench Detector, Alcove 3b***

***(Counter = Quench Detection)***

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Sunday-January 02, 2005: MS-038, Yellow Quench: File# = 1104668516***

Permit ID: 3b-ps1      Timestamp: 07:21:56 +37801      Beam Permit Fail Timestamp: 07:17:12 +1547596

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 3b-qd1, Y3DSA2\_A1VT Int. 100, Tq= -24

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): No Beam in the machine.

Main Magnet Power Status: Ramping down from LastStone, tripping at YMD = 473 amps, YMQ = 446 amps.

**Technical Notes / Sequence of Events:** Engineers had trouble logging into the systems from home. Refer to MS-039 for further details.

QLI Recovery TAPE Start: 08:58:17      Link Recovered Time: 09:05:53      Estimated Down Time: 100 minutes

***Quench Analysis: Quench Detector, Alcove 3b***

**(Counter = Quench Detection)**

***Sunday-January 02, 2005: MS-039, Blue Quench: File# = 1104674886***

Permit ID: 3b-ps1      Timestamp: 09:08:04 +2987794      Beam Permit Fail Timestamp: 09:08:04 +2987825

QPAControl / Timing Resolver:

Quench Detector(s) Trip: 3b-qd1, B2DSA5\_A4VT Int. 20, Tq= -25

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Ramping to Injection, tripping at BMD = 203 amps, BMQ = 193 amps.

QLI Recovery TAPE Start: 09:41:29      Link Recovered Time: 09:50:56      Estimated Down Time: 42 minutes

***Sunday-January 02, 2005: MS-039, Yellow Quench: File# = 1104674886***

Permit ID: 3b-ps1      Timestamp: 09:08:04 +2988819      Beam Permit Fail Timestamp: 09:08:04 +2987825

QPAControl / Timing Resolver:

Quench Detector(s) Trip: 3b-qd1, Y2DSA5\_A4VT Int. 20, Tq= -24

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Ramping to Injection, tripping at BMD = 203 amps, BMQ = 193 amps.

**Technical Notes / Sequence of Events:** Possible Open Channel. Continue to investigate.

09:09; Another QLI when ramping back to injection. Charles is coordinating with ITD service to provide crypto-card access for some people to diagnose this problem. -TJS

09:50; Don reports that Wing found something suspicious going on with the 3b-qd1-quench detector. He has sent calibration pulse in the hopes of clearing the problem. Carl will attempt to login from home now, but he feels that the dual QLI is a symptom of a permit or quench protection type of problem. Charles is running the quench recovery now... -JPJ

QLI Recovery TAPE Start: 09:51:34      Link Recovered Time: 09:59:34      Estimated Down Time: 51minutes

***Quench Analysis for MS-039: Quench Detector, Alcove 3b***

**(Counter = Quench Detection)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

#### **Sunday-January 02, 2005: MS-040, Blue Quench: File# = 1104685141**

Permit ID: 9b-ps1      Timestamp: 11:59:00 +1032507      Beam Permit Fail Timestamp: 11:51:28 +73928  
QPAControl / Timing Resolver:  
Quench Detector(s) Trip: 9b-qd1 failed, In the Pink.  
5 Minute: Quench Delay File: Systems Running, no detections indicated.  
Beam Loss Monitors (Rads/Hr): N/A  
Main Magnet Power Status: Zero Current  
QLI Recovery TAPE Start: 12:05:11    Link Recovered Time: 12:13:32    Estimated Down Time: 14 minutes

#### **Sunday-January 02, 2005: MS-040, Yellow Quench: File# = 1104685141**

Permit ID: 9b-ps1      Timestamp: 11:59:00 +1032507      Beam Permit Fail Timestamp: 11:51:28 +73928  
QPAControl / Timing Resolver: N/A  
Quench Detector(s) Trip: 9b-qd1 failed, In the Pink.  
5 Minute: Quench Delay File: Systems Running, no detections indicated.  
Beam Loss Monitors (Rads/Hr): N/A  
Main Magnet Power Status: Zero Current

**Technical Notes / Sequence of Events:** Quench Detection Reset, Controls is investigating.

11:59 Roger Lee reset the cfe-9b-qd1 quench detector through the serial link -TJS, JPJ, NAK.CP

12:27 Details are available in /home/cfsd/rclee/9b-qd1.txt. Maybe Larry, Al, or Tom can see something wrong. It looked like it could not receive anything on TCP stack.

11:59 I've zeroed out all triplet position offsets (Q1/3, DX) for IR6/8 since hardware has changed since the last run when these were measured. We will put in new offset values when they are calculated from BBA. -TJS

13:45 yo9-sxd-ps looks like it survived the last hysteresis cycle. Not sure what was wrong but I think the qpa was tripping on a crowbar fault after ramping down from the training at 10 amps. It could have been it was being ramped down too fast but I am not positive. We trained it again just to make sure that was not the problem. It did not trip this time after the hysteresis cycle. I will keep an eye on it. -Don Bruno [yellow] [ps]

QLI Recovery TAPE Start: 12:13:46    Link Recovered Time: 12:21:18    Estimated Down Time: 22 minutes

**Quench Analysis for MS-040: Quench Detector cfe-9b-qd1 Reset**

**(Counter = Quench Detection)**

#### **Monday-January 03, 2005: MS-041, Yellow Quench: File# = 1104809798**

Permit ID: 8b-ps1      Timestamp: 22:36:36 +2171977      Beam Permit Fail Timestamp: 22:36:36 +2172007  
QPAControl / Timing Resolver: QD Alarms, y-QD, QLI, YI1 first, no faults indicated  
Quench Detector(s) Trip: 8b-qd2, Y8QFQ2\_VT Int. 1, Tq= -24  
5 Minute: Quench Delay File: File not available.  
Beam Loss Monitors (Rads/Hr): High Level near the Sector 8 Triplet; y8-lm2.1 = 4611.62, q2 magnet  
Main Magnet Power Status: Ramping to LastStone, tripping at: YMD = 4307.92 amps, YMQ = 4014.07 amps

**Technical Notes / Sequence of Events:** Yellow quench link trip was caused by 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2\_VT. The beam permit tripped after the quench link. There was a real magnet quench at y8q2. There was a high beam loss at y8-lm2.1 for over 1.36 sec. Are the BLM thresholds correct? There is now 7 beam induced quenches for this run. There were no problems with any power supply prior to the quench. -Ganetis [quench]

**Physics Summary:** We also suffered a magnet quench due to excessive beam loss at IR8 during one of the ramps when the Qy dipped down to 0.2. This was purely because I mistakenly lowered the Qy in yellow by 0.02 even though I meant to lower the Qx by 0.02. However, this quench event did give me a very useful data point on setting the lm1's slow loss limit. They are now sitting at 1500 based on the data we had. -Mei

QLI Recovery TAPE Start: 22:46:31    Link Recovered Time: 22:55:40    Estimated Down Time: 29 minutes

**Quench Analysis: Beam Induced (Counter = BI #007)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Monday-January 03, 2005: MS-042, Blue Quench: File# = 1104847417***

Permit ID: 3b-ps1      Timestamp: 09:03:36 +1539495      Beam Permit Fail Timestamp: 09:03:36 +1539526

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 3b-qd1, B2QDA6\_A7VT Int. 100, Tq = -23

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Steady at Injection Current Levels.

**Technical Notes / Sequence of Events:** Refer to MS-043

QLI Recovery TAPE Start: 09:45:46      Link Recovered Time: 09:54:10      Estimated Down Time: 51 minutes

**Quench Analysis: Quench Detection System 3b**

**(Counter = Quench Detection)**

***Tuesday-January 04, 2005: MS-043, Yellow Quench: File# = 1104847419***

Permit ID: 3b-ps1      Timestamp: 09:03:36 +3306595      Beam Permit Fail Timestamp: 09:03:36 +1539526

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 3b-qd2, Y2DSA5\_A4VT, Int. 100, Tq = -24

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Steady at Injection Current Levels.

**Technical Notes / Sequence of Events:** QD Plot shows voltage tap signals drifting down from zero when they should be steady near zero when supplies are not ramping.

Blue & Yellow quench link trips were caused by 3b-qd1-quench detector. The quench detector temperature compensation channel is not working. It looks like the channel has some kind of intermittent problem. This is the same problem that happened on Sunday. I short ring access will be required to change a quench detector card out. -Ganetis [quench]

QLI Recovery TAPE Start: 09:33:47      Link Recovered Time: 09:45:07      Estimated Down Time: 42 minutes

**Quench Analysis: Quench Detection System 3b**

**(Counter = Quench Detection)**

***Tuesday-January 04, 2005: MS-044, Blue and Yellow Quench: File# = 1104863322***

Permit ID: Blue: 3b-ps1      Timestamp: 13:28:40 +2119882      Beam Permit Fail Timestamp: 13:11:20

Permit ID: Yellow: 3b-ps1      Timestamp: 13:28:40 +2119882      Beam Permit Fail Timestamp: 13:11:20

Main Magnet Power Status: Zero Currents.      DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Received a call from Wing Louie that he had been given permission to enter the ring to replace a Single Gain Mux Card in the 3b-qd1 quench detector. (Calibration Channel was failing) Dan Oldham had shutdown power to the rack, causing both links to drop. This is considered maintenance because MCR had other issues going on at the same time that allowed Wing to replace the card. G. Heppner

Blue QLI Recovery TAPE Start: 13:51:59      Link Recovered Time: 14:00:53      Down Time for Blue Ring: 33 minutes

Yellow QLI Recovery TAPE Start: 14:01:17      Link Recovered Time: 14:09:28      Down Time for Yellow Ring: 42 minutes

**Quench Analysis: Maintenance Related to 3b-qd1**

**(Counter = Maintenance)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

#### **Thursday-January 06, 2005: MS-045, Blue Quench: File# = 1105050080**

Permit ID: 4b-time.B    Timestamp: 17:21:20 +929213    Beam Permit Fail Timestamp: 17:21:20 +929220

QPAControl / Timing Resolver: Blue Main Dipole, Current Monitor

Quench Detector(s) Trip: All tripped indicating Positive Tq Values.

5 Minute: Quench Delay File: Systems Running, no indications of trips.

Beam Loss Monitors (Rads/Hr): Beam Aborted Properly without causing a Magnet Quench.

Main Magnet Power Status: Ramping to LastStone, tripped at BDMC = 4299.85 amps, BQMC = 4000.85 amps

Main Magnet Control Page indicates a 1) Current Monitor Alarm, 2) Out Current 2 Fault.

4B Mains Timing Resolver indicates that Blue Dipole Flattop was first to acknowledge.

Postmortem Plot indicates Voltage Oscillation occurs after the switch over from ramp to Flattop had occurred.

This is what caused the Blue Link to come down. [G. Heppner](#)

#### **Technical Notes / Sequence of Events:**

17:40:00, The Cryo Control Room reported that they did not see any significant temperature increases due to the blue QLI. The quench link is being recovered.

Blue quench link trip was caused by blue main dipole power supply. It had a Out Curr 2 Fault. This happened right after the ramp power module switched to the flattop power module at the end of the ramp to top energy. [-Ganetis \[quench\]](#)

Carl reported that the switch between the ramp and flattop supplies occurred cleanly. He, at this point, does not have an explanation for the oscillation on the main dipole. He plans to continue his investigation into the issue this evening. For now, he reported that we should continue ramping with beam. [-jak](#)

Update: It appears that the Hardware Gain Switched from Ramp to Flattop in the Voltage Feedback but the software Scaling Factor did not, resulting in an unstable voltage loop. [Carl Schultheiss](#)

QLI Recovery TAPE Start: 17:33:56    Link Recovered Time: 17:43:13    Estimated Down Time: 22 minutes

#### **Quench Analysis: Blue Main Dipole Oscillation**

**(Counter = Main Power Supplies)**

#### **Friday-January 07, 2005: MS-046, Yellow Quench: File# = 1105116592**

Permit ID: 10a-p3.A    Timestamp: 11:49:52 +663643    Beam Permit Fail Timestamp: 11:49:52 +663672

QPAControl / Timing Resolver: QP03-R10AQT4-yi10-tq5-qp first to trip, no fault indication.

Quench Detector(s) Trip: N/A

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): No Beam in the machine.

Main Magnet Power Status: Zero Currents. (MCR: Brought ps to zero and shut off yi10-qd2 to bring link down

(although I guess we didn't need to bring the link down for a tq replacement). PS personnel are swapping the supply. [-gjm](#)

**Technical Notes / Sequence of Events:** Interesting, I saw the signal had Railed to the Maximum Value on the g2 plotter and when I investigated the actual Supply Status, it had lost power and was no longer functioning. MCR had not mentioned it in the log but it is believed because the magnet current was operating at such a low current value, that it had no affect on the beam. In fact, they elected to Run beam until RF had a problem around 11:02 A.M. Beam store started around 04:40 A.M. [G. Heppner](#)

Jeff Wilke and Joe Drozd are swapping out yi10-tq5-ps. This is not part of the main yellow link. MCR thought that the yellow main link needed to come down to do this work that is the reason for the yellow QLI at 11:49. [-Don Bruno](#)

QLI Recovery TAPE Start: 12:48:24    Link Recovered Time: 12:56:17    invoked Estimated Down Time: see MS-047

#### **Quench Analysis: MCR dropped the link when it was not required for y10-tq5 repair.**

**(Counter = Operator Error)**



***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Friday-January 07, 2005: MS-047, Yellow Quench: File# = 1105120556***

Permit ID: 8b-ps1      Timestamp: 12:55:56 +175825      Beam Permit Fail Timestamp: 12:55:56 +175855  
QPAControl / Timing Resolver: QP03-R8BBQF3-yi7-qf3-qp first to trip, no faults indicated.  
Quench Detector(s) Trip: Systems running, no detections indicated.  
5 Minute: Quench Delay File: Systems Running, no detections indicated.  
Beam Loss Monitors (Rads/Hr): No Beam in the machine.  
Main Magnet Power Status: Park Currents / Recovery Tape running commands  
Postmortems: Nothing to indicate a power supply fault.

**Technical Notes / Sequence of Events:** Recovering from MS-046 QLI, TAPE was halted. There is no evidence of a failure or as to why the recovery failed. Don called George and according to him, there is supposed to be a 15ms time interval between time stamps indicated between the Timing Resolver counts. This may indicate a possible loose connection in the K-lock string. [G. Heppner](#)

QLI Recovery TAPE Start: 13:23:13      Link Recovered Time: 13:31:16      Estimated Down Time: 101minutes

**Quench Analysis: Unexplained, possible loose connection in 1008B**  
**(Counter = Other)**

***Friday-January 07, 2005: MS-048, Yellow Quench: File# = 1105136124***

Permit ID: 2b-ps1      Timestamp: 17:15:24 +494113      Beam Permit Fail Timestamp: 17:15:24 +494142  
QPAControl / Timing Resolver: QP08-R2BYQF4-y2-q6-qp first to trip, no faults indicated.  
Quench Detector(s) Trip: All tripped indicating positive Tq Values.  
5 Minute: Quench Delay File: Systems Running, no detections indicated.  
Postmortems: Nothing to indicate a power supply fault.  
Beam Loss Monitors (Rads/Hr): Appears as a proper Beam Dump for both rings.  
Main Magnet Power Status: Ramping from Injection to LastStone, tripping at the following currents:  
    Yellow Dipole = 2247.70 amps, Yellow Quad = 2092.82 amps  
    Main Magnet Control Page indicates for Yellow Quad a Current Monitor Alarm

**Technical Notes / Sequence of Events:**

Yellow quench link trip looks like it was caused by an intermittent cable or connection between the y2-q6 QPA to QPAIC. ( quench switch to its control chassis ) -[Ganetis \[quench\]](#)

QLI Recovery TAPE Start: 17:59:05      Link Recovered Time: 18:08:07      Estimated Down Time: 53minutes

**Quench Analysis: Possible loose connection**  
**(Counter = Other)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Saturday-January 08, 2005: MS-049, Yellow Quench: File# = 1105200063***

Permit ID: 5b-ps1      Timestamp: 11:01:00 +3305025      Beam Permit Fail Timestamp: 11:01:00 +3305057

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 5b-qd1, Y4QFA3\_A2VT, Int. 1, Tq= -24

5 Minute: Quench Delay File: Systems Running, no detections indicated.

Beam Loss Monitors (Rads/Hr): No Beam in the Machine.

Main Magnet Power Status: Ramping from Injection to Park, tripping at the following currents:

Yellow Dipole = 406.87 amps, Yellow Quad = 385.07 amps

Looking at the 1004B Postmortem Data, The Yellow Main Quad indicated a sudden drop (spike) in the Iref signal of approximately 87 amps starting at T= 0.038889 for a time period lasting 0.004117 seconds. The Error Signal corresponds with a drop of 35volts in the same time frame. Comparing this to the RTDL Signals, Yellow Quad I Set shows a flat-line (pause) in the down ramp signal at T= -0.390278 until T= - 0.388889 equaling a time frame of .001389 seconds. Talking with Carl Schultheiss, this signal originates from Controls. This pause in the RTDL Signal is long enough to cause the Main Quad to glitch in the down ramp, causing the Quench Detector to trip. [G. Heppner](#)

**Technical Notes / Sequence of Events:** Yellow quench link trip was caused by 5b-qd1-quench detector. The quench detector tripped because of a main quad power supply current spike during the down ramp from injection to park. The current spike was caused by a glitch in the setpoint from the control system. -CS [yellow] [quench]

QLI Recovery TAPE Start: 11:23:43      Link Recovered Time: 11:35:24      Estimated Down Time: 35minutes

**Quench Analysis: Glitch in the Setpoint Signal from Controls**  
**(Counter = Controls Related)**

***Monday-January 10, 2005: MS-050, Blue Quench: File# = 1105368607***

Permit ID: Blue: 2b-ps1      Timestamp: 09:50:04 +3206819      Beam Permit Fail Timestamp: 09:31:20

Main Magnet Power Status: Zero Currents.

**Technical Notes / Sequence of Events:**

1) The qpa bo2-tq6-qp was swapped out. There was a loosed D connector on the qpa end that caused this p.s. to trip on a quench fault. -Don Bruno

2) In addition to maintenance allowed for repairs to b2-tq6, the Blue Link was taken down to replace the Timing Resolver in 1002B (B1.R2BBQF3). The link was restored and upon testing of signals to the Timing Resolver verification process, a "Set All Bits to 0" was initiated to the 2b-qd1 Quench Detector under the careful watch of Wing Louie. In doing this, the DX Heaters were forced to trigger, firing all four DX Magnet heaters from the 1002B location causing the Blue Link to drop once again, ***File # = 1105372749***. Timing Resolver Signals all appear to be working at this time, brought the link back up and handed over to MCR. -G Heppner

QLI Recovery TAPE Start: 10:31:41

Link Recovered Time: 10:44:15

QLI Recovery TAPE Start: 11:06:47

Link Recovered Time: 11:19:54      Estimated Down Time: 90minutes

**Quench Analysis: Maintenance Related, replaced Timing Resolver at 1002B (B1.R2BBQF3).**  
**(Counter = Maintenance)**



***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Tuesday-January 11, 2005:***

**Start of the fy05 Cu-Cu Physics Run at 21:00!**

**Note: All Reference QLI File Numbers now start with PR- (Physics Run)**

**Scheduled Maintenance 08:00 to 16:30**

***Wednesday-January 12, 2005: PR-001, Blue and Yellow Quench Files:***

Beam Aborted for the start of maintenance at

**File# = 1105539011**      **Permit ID: Yellow: 8b-ps1**      **Timestamp: 09:10:08 +3582799**

**Cause:** yi7-qd2-ps placed into the off state.

**File# = N/A**      **Permit ID: Blue: 12a-ps1.A**      **Timestamp: 09:25:32 +969956**

**Cause:** Controls turned off the power to the 720Hz chassis.

**Main Magnet Power Status:** Zero Currents. **DX Heaters:** None fired.

**Technical Notes / Sequence of Events:**

1. Node card feeding yi3-th5-ps and yi3-tv4-ps replaced. 2. Broken triplet magnet fans replaced. 3. Sextupole p.s. yo1-sxd-ps re-tuned. 4. Tests for bad connections done on 1010A qpaic-A1 and yi7-qf3-qp. 5. Ran the snakes up to 1 amp, except for two of them. 6. Inspected y2-q6-qp. -Don Bruno [rhic] [ps]

**Blue Recovery TAPE Start: 19:22:26**      **Link Recovered Time: 19:31:27**      **Down Time for Blue: 597 minutes**

**Yellow Recovery TAPE Start: 19:34:15**      **Link Recovered Time: 19:58:41**      **Down Time for Yellow: 624 minutes**

**Quench Analysis: Scheduled Maintenance**

**(Counter = Maintenance)**

***Thursday-January 13, 2005: PR-002, Yellow Quench: File# = 1105642164***

**Permit ID: 8b-ps1**      **Timestamp: 13:49:24 +863477**      **Beam Permit Fail Timestamp: 13:49:24 +863507**

**QPAControl / Timing Resolver:** no faults indicated, y-QD, QLI first trip, yi7-tq4, 5 & 6 all tripped to standby.

**Quench Detector(s) Trip:** Main Detector: 8b-qd2, Y7QFQ3\_VT Int. 1, Tq= -24

Auxiliary Detector: 8b-qd2, Y7TQ6\_VT at 13:50:33

**5 Minute: Quench Delay File:** (8b-qd2), Y7QFQ3\_VT and Y7DRDO\_D0

**Beam Loss Monitors (Rads/Hr):** Multiple High Levels in Sector 7 Triplet area:

y7-lm3.2 = 4543.41, y7-lm3.1 = 4656.28, y7-lm2.1 = 25991.84, g7-lm1 = 4860.44, y7-lm0 = 4797.49

**Main Magnet Power Status:** Store Energy

**Technical Notes / Sequence of Events:** In addition to the y7q3 and y7d0 magnet quenches, yi7-tv2 also indicated a real magnet quench had occurred (high levels of radiation). G Heppner

Yellow quench link trip was caused by 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y7QFQ3\_VT. The beam permit tripped after the quench link. There were real magnet quenches at y7q3 and y7d0. There were high beam losses at y7-lm3.2, y7-lm3.2c, y7-lm0, and g7-lm1 for over .076 sec. Are the BLM thresholds correct? There is now 8 beam induced quenches for this run. There were no problems with any power supply prior to the quench. -Ganetis [quench]

**Physics Log:** 13:51, while at flattop after the last ramp. We were starting to do a Down sequence, but it had not taken effect yet. -TJS

**QLI Recovery TAPE Start: 16:13:56**      **Link Recovered Time: 16:21:26**      **Estimated Down Time: 152 minutes**

**Quench Analysis: Beam Induced Quench (Counter = BI #008)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

**Thursday-January 13, 2005: PR-003, Blue Quench: File# = 1105642165**

Permit ID: 8b-ps1      Timestamp: 13:49:24 +863507      Beam Permit Fail Timestamp: 13:49:24 +863507

QPAControl / Timing Resolver: no faults indicated, b-QD, QLI first trip.

Quench Detector(s) Trip: Main Detector: 8b-qd2, B7DRDO\_D0 Int. 5, Tq= -23

5 Minute: Quench Delay File: None indicated for blue (See Yellow PR-002)

Beam Loss Monitors (Rads/Hr): High Levels in Sector 7 Blue: b7-lm3.1 = 3757.24, b7-lm2.1 = 2315.88

Main Magnet Power Status: Store Energy

**Technical Notes / Sequence of Events:** Blue quench link trip was caused by 8b-qd1-quench detector. The quench detector tripped because of magnetic coupling between the Y7D0 and B7D0 magnets. When the Y7D0 had a real quench it induced a voltage into the B8D0 magnet that the blue quench detector interprets as quench. -Ganetis [quench]

**Physics Log:** 14:22, bo7-qf8 shows some activity about 0.4 before the QLI. This is the area that the CCR reports seeing heat load from. George is analyzing the data...he found that high beam losses caused two real magnet quenches at y7-q3 and y7-dh0. The beam losses were very high and fast in that area, but we only received an "accumulated loss monitor" permit interlock after both QLI's occurred. The Blue link dropped only due to cross talk with the Yellow dh0. Chris is speaking with Mei now about the loss monitor configuration. We are now waiting on clearance from Cryo to recover. -JPJ

14:45, Mei reports that she is looking into why the fast losses didn't pull the permit at all, with help from Peter Oddo. -JPJ

14:52, Cryo is still seeing heat in the 9 o'clock area -- they are making an entry into that area to investigate while we wait for the clearance to perform quench recovery. -TJS, JPJ

15:04, Peter and I discovered the b7-lm2.1 and y7-lm2.1 didn't respond to our HV cycling at all. There can only two possibilities: either both channels have tremendous negative offsets or the v118 module in the crate is broke. Peter will ask Tony to take a look at it. And at the same time Peter will check the respond time of the y7-lm3.1 and b7-lm3.1 with this very fast rising losses. -Mei

16:30, Continued analysis of the yellow quench at 13:49:25. There is definitely coherence that builds up just before the quench in yellow; DCCTs indicate that blue beam was aborted cleanly, then yellow beam started to go almost immediately unstable and dumped large losses into the yellow triplet. The quench was not correlated with cogging. The instability is quite fast, and rises very rapidly after an initial small rise. This does not have the signature of a prefire. It may be that persistent currents from flattop had yellow beam just barely on the edge of stability -- but this would have to be a very touchy situation. -TJS, Thomas

QLI Recovery TAPE Start: 16:03:38      Link Recovered Time: 16:10:48      Estimated Down Time: 141 minutes

**Quench Analysis: Magnetic Coupling between Y7D0 and B7D0(Counter = Other)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

***Friday-January 14, 2005: PR-004, Blue Quench: File# = 1105697388***

Permit ID: 9b-ps1      Timestamp: 05:09:48 +385968      Beam Permit Fail Timestamp: 05:09:48 +385998

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: All tripped (10 had -Tq Values, 2 indicated positive Values)

5 Minute: Quench Delay File: No indications, all systems running.

Beam Loss Monitors (Rads/Hr): Beam Dump in Blue looks good, however, there appears to be parasitic losses past the normal CQS-5 going further down the line to the CQS-20 magnet (513.32 rads/hr).

Main Magnet Power Status: Store Energy. Blue Dipole Main indicated a Current Monitor Fault after the QLI. There was also a Ground Current Bit set (PS Ground Current Warning) indication for the Yellow Dipole Main Magnet Power Supply.

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** Consulting with George and Carl after viewing Postmortem Plots for b-qtrim whereas the Iref / wfg inputM changed at -0.027 seconds prior to T = zero while the wfg output looked clean, it appears the signal had been corrupted from within the Toldo Interface Box. This caused the Iref while at 129.11 to suddenly drop to 120.39 and then go to a maximum of 299.99amps. All Quad magnets throughout the ring echoed this change in current pulling multiple quench detectors, therefore dropping the Blue Link. G. Heppner

Confirmation: Blue quench link trip was caused by 9b-qd1-quench detector. Nine other quench detectors tripped before the blue link tripped. B-qtrim-ps Iref went to maximum current of 300 Amps. The power supply tried to follow. This is what caused the quench detectors to trip. There was no problem with the WFG signals to the "Toldo Box ". If this occurs again replace the "Toldo Box " -Ganetis [quench]

#### **Physics Log:**

05:35:00 Machine setup. The blue quench link has been restored. The Cryo Control Room did not report seeing any temperature fluctuations due to the QLI. Operations is preparing for a RHIC hysteresis ramp.

05:40:00 C. Schultheiss was contacted (as per the alarm instructions) about a yellow main dipole ground current alarm. The alarm had occurred while the mains were sitting at zero. C. Schultheiss reported that we could reset the alarm and ramp the RHIC supplies.

QLI Recovery TAPE Start: 05:20:33      Link Recovered Time: 05:30:29      Estimated Down Time: 10 minutes

**Quench Analysis: Toldo Interface Box suspected for b-qtrim, 1004B.**

**(Counter = IR)**

***Friday-January 14, 2005: PR-005, Blue Quench: File# = 1105717824***

Permit ID: 10a-ps3.A      Timestamp: 10:50:24 +876339      Beam Permit Fail Timestamp: 08:47:16 +558283

QPAControl / Timing Resolver: DX-QLI Out, B11 first, no faults indicated

Quench Detector(s) Trip: 10a-qd1, B10DRDX\_VT, Int. 5, Tq= -23

5 Minute: Quench Delay File: No indications, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

Main Magnet Power Status: Injection Current.

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** Postmortems show no indication of a power supply fault. However, Qdplots shows the B10DRDX\_VT to have glitches -0.13163 seconds before T=zero during one of the Booster Magnet Pulses. Unknown as to the cause at this time, consulting with George and Wing, there might be a possible problem within the firing card. George had MCR cycle to power supply to off and then bring the link back up to resume operations. G. Heppner

Confirmation: Blue quench link trip was caused by 10a-qd1-quench detector. The quench detector tripped due to a sudden increase in current on b10-dhx-ps. The increase was .9 Amps in .05 sec. This can only be seen in the quench detector data, the MADC data is too noisy. -Ganetis

QLI Recovery TAPE Start: 12:19:23      Link Recovered Time: 12:26:53      Estimated Down Time: 97 minutes

**Quench Analysis: b10-dhx-power supply glitch.**

**(Counter = IR)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Monday-January 17, 2005: PR-006, Yellow Quench: File# = 1106019492***

Permit ID: 4b-time.B    Timestamp: 22:38:12 +136626    Beam Permit Fail Timestamp: 22:27:08 +1207055

QPAControl / Timing Resolver: No faults indicated, y-BP RDY first to indicate.

Quench Detector(s) Trip: All Main Quench Detectors fired indicating positive Tq values, no Auxiliary trips.

5 Minute: Quench Delay File: No indications, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

Main Magnet Power Status: Injection Current.

**Technical Notes / Sequence of Events:** y-qmain-ps, Reg DCCT, Postmortem shows nothing unusual except for noisy read-backs on the mains. Carl pointed out and we looked at the Log View Cold Box for the Main Quad signal and it clearly showed a sudden drop in temperature of 4.5 Degrees Celsius. This quick change in temperature was the cause for the DCCT Regulator Error for the Main Quad Power Supply. Since the cause of this QLI was do to a faulty ODH Sensor that brought the buildings emergency exhaust fans on for awhile that quickly dropped the ambient temperature from 77.48 degrees down to the outside temperature of 36.13 degrees, this is charged to the Controls counter. *G. Heppner*

Yellow link trip caused by a DCCT Reg. Fault on the Yellow Main Quad P.S. -Ganetis [quench]

QLI Recovery TAPE Start: 23:36:17    Link Recovered Time: 23:43:37    Estimated Down Time: 66 minutes

**Quench Analysis: Sudden Building Temp changed due to faulty ODH Sensor**  
**(Counter =Other)**

***Monday-January 17, 2005: PR-007, Blue Quench: File# = 1106019493***

Permit ID: 4b-time.B    Timestamp: 22:38:12 +1480401    Beam Permit Fail Timestamp: 22:27:08 +1207055

QPAControl / Timing Resolver: No faults indicated, b-BP RDY first to indicate.

Quench Detector(s) Trip: All Main Quench Detectors fired indicating positive Tq values, no Auxiliary trips.

5 Minute: Quench Delay File: No indications, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

Main Magnet Power Status: Injection Current.

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** b-qmain-ps, Reg DCCT, Postmortem shows nothing unusual. Carl pointed out and we looked at the Log View Cold Box for the Main Quad signal and it clearly showed a sudden drop in temperature of 4.5 Degrees Celsius. This quick change in temperature was the cause for the DCCT Regulator Error for the Main Quad Power Supply. Since the cause of this QLI was do to a faulty ODH Sensor that brought the buildings emergency exhaust fans on for awhile that quickly dropped the ambient temperature from 77.48 degrees down to the outside temperature of 36.13 degrees, this is charged to the Controls counter. *G. Heppner*

Blue link trip caused by a DCCT Reg. Fault on the Blue Main Quad P.S. -Ganetis [quench]

At 2220 MCR responded to "A = B Div. ERROR" ODH alarm in the 4 o'clock service building (1004b). OPM 3-15-01 was executed. COG found that the alarm was erroneous, as described in paragraph 5.1.8.5. Walter Lamar is coming in to serve as the required ACG to re-calibrate the ODH sensor -Sanjee, CFW, MES

QLI Recovery TAPE Start: 23:28:25    Link Recovered Time: 23:35:58    Estimated Down Time: 58 minutes

**Quench Analysis: Sudden Building Temp changed due to faulty ODH Sensor**  
**(Counter =Main Power Supply)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Tuesday-January 18, 2005: PR-008, Blue Quench: File# = 1106025657***

Permit ID: 7b-ps1      Timestamp: 00:20:56 +1047792      Beam Permit Fail Timestamp: 22:27:08

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 7b-qd1, B6QFA3\_A2VT, Int. 1, Tq -24  
11b-qd1, B10QFA3\_A2VT, Int. 1, Tq -24

5 Minute: Quench Delay File: No indications, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

Main Magnet Power Status: Ramping from Injection to store; BDMC = 901.89amps, BQMC = 848.23amps.

DX Heaters: Did not fire.

***Technical Notes / Sequence of Events:*** Postmortems show the Blue Quad Main Ramp Current oscillating about 1000 amps peak to peak. Log View Cold Box Temperature was still below 21 Degrees Celsius when the normal operating temperature is between 24 and 25 degrees Celsius. *G. Heppner*

Blue quench link trip was caused by 7b-qd1-quench detector. One other quench detector tripped before the blue link tripped. The quench detectors tripped because the blue main quad p.s. went into oscillation during the ramp to top energy. It looks like this occurred when the main quad was switching from flattop to ramp power modules. This problem could have been caused by the 40 F drop in temperature this building had when there was a failure of an ODH sensor that caused the building fans to stay on. -Ganetis

QLI Recovery TAPE Start: 00:34:08      Link Recovered Time: 00:45:47      Estimated Down Time: 25 minutes

***Quench Analysis: Blue Main Quad Oscillating during Ramp.***

***(Counter = Main Power Supply)***

***Tuesday-January 18, 2005: PR-009, Blue Quench: File# = 1106028234***

Permit ID: 4b-time.A      Timestamp: 01:03:52 +2630678      Beam Permit Fail Timestamp: 22:27:08

QPAControl / Timing Resolver: QP10-R4BD3-b4-dh0-qp first to indicate, no faults listed.

Quench Detector(s) Trip: Main Blue Quench Detectors tripped indicating positive Tq values, no auxiliary trips.

5 Minute: Quench Delay File: No indications, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

Main Magnet Power Status: Ramping down from LastStone. BDMC = 3076.05amps, BQMC = 2863.91amps

DX Heaters: Did not fire.

***Technical Notes / Sequence of Events:*** 1) b4-dh0-ps, Stby-Error, AC Power, Standby, Remote, DC Overcurrent, Quench. 2) The b-dmain-ps indicated a Current Monitor Fault. 3) Postmortems indicate the voltage signal for b4-dh0-ps suddenly spikes down by 2.103v at T= -0.049 seconds. As it returns to normal, the signal shows instability, causing the supply to trip to standby, Iref drops before T=zero. *G. Heppner*

Blue quench link trip was caused by a b4-dh0-ps DC over-current fault. The p.s. current was not near the trip level so it looks like a p.s. controls problem. This problem could have been caused by the 40 F drop in temperature this building had when there was a failure of an ODH sensor that caused the building fans to stay on. -Ganetis

The Timing Resolver picked out b4-dh0 as the cause of the blue QLI at 01:03. The p.s. had a DCOC fault on it. I am not sure if the DCOC fault was real from the looks of the waveform. For now I brought the link up in 4b only, tested the supply to 15A and it looks ok. I will let MCR bring the whole blue link up now and do a Hysteresis ramp and see if the supply survives to high current. -Don Bruno

QLI Recovery TAPE Start: 02:13:05      Link Recovered Time: 02:20:23      Estimated Down Time: 25 minutes

***Quench Analysis:***

***(Counter =IR Power Supply)***

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Tuesday-January 18, 2005: PR-010, Blue and Yellow Quench: File# = 1106065810***

Permit ID: Blue: 7b-ps1      Timestamp: 11:30:08 +2004686      Beam Permit Fail Timestamp: 13:11:20  
Permit ID: Yellow: 7b-ps1      Timestamp: 11:30:08 +2004686      Beam Permit Fail Timestamp: 13:11:20

Main Magnet Power Status: Zero Currents.    DX Heaters: All fired.

**Technical Notes / Sequence of Events:** At 11:09, the Physics Log reported Quench detection controls failure. They ramped both rings down to resolve the situation. Found most of the Yellow Quench Detectors in the fail state (PINK) except for 1b-qd1, 7b-qd1 & 10a-qd2, they were running. All of the Blue Main and Auxiliary Quench Detectors had been found in the fail state. A reset was required for all of these and that caused both links to go down. *G. Heppner*

*Physics Log:* Most of the QD FEC's went down at the same time. I haven't heard any conclusions yet, but the Controls people were forced to reboot each one after we ramped the magnets down to zero. -JPJ

Blue Recovery TAPE Start: 12:16:14    Link Recovered Time: 12:25:34    Down Time for Blue Ring: 55 minutes  
Yellow Recovery TAPE Start: 12:26:37    Link Recovered Time: 12:34:20    Down Time for Yellow Ring: 64 minutes

**Quench Analysis: Multiple Quench Detector FEC's Overloaded – Data unable to transmit.**  
**(Counter = Quench Detector Fault)**

***Tuesday-January 18, 2005: PR-011, Blue and Yellow Quench: File# = 1106070268***

Permit ID: Blue: 1b-ps1      Timestamp: 12:44:28 +935993      Beam Permit Fail Timestamp: 13:11:20  
Permit ID: Yellow: 1b-ps1      Timestamp: 12:44:28 +938043      Beam Permit Fail Timestamp: 13:11:20

Main Magnet Power Status: Zero Currents.    DX Heaters: Restored from last QLI (PR-0101).

**Technical Notes / Sequence of Events:** After the initial reset of all the quench detectors, 1b-qd1 for Blue and Yellow Main and Auxiliary Quench Detectors were still in the fail state so another reset was required, causing both links to drop. *G. Heppner*

*Physics Log:* cfe-1b-qd1 came up after the first reboot with a max memory block range error alarm. Tom investigated and decided that we had to reboot it again. Charles is in the midst of recovering from the reset now. -JPJ, CCP

Blue Recovery TAPE Start: 12:48:41    Link Recovered Time: 12:56:36    Down Time for Blue Ring: 12 minutes  
Yellow Recovery TAPE Start: 12:56:47    Link Recovered Time: 13:04:23    Down Time for Yellow Ring: 20 minutes

**Quench Analysis: Multiple Quench Detector FEC's Overloaded – Data unable to transmit.**  
**(Counter = Quench Detector Fault)**



## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

**Wednesday-January 19, 2005: PR-012, Blue Quench: File# = 1106116465**

Permit ID: 8b-ps1      Timestamp: 01:34:24 +1316817      Beam Permit Fail Timestamp: 01:34:24 +730499

QPAControl / Timing Resolver: No faults indicated, b-QD, QLI and y-QD QLI first to register.

Quench Detector(s) Trip: 8b-qd1, B7QFQ3\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: (6b-qd1) B5QFQ3\_VT

(8b-qd1) B7QFQ3\_VT, B7QFQ2\_VT, B7QFQ1\_VT, B8QFQ3\_VT, B7DRD0\_D0

Beam Loss Monitors (Rads/Hr): Scattered Beam throughout the machine, BLM show most losses after T=zero except for b7-lm3.1 where losses begin to rise 2.5 seconds before T=zero. Highest levels below are near magnets that indicate a beam induced quench had occurred:

Sector 5, Multiple High Losses near the triplet magnet: b5-lm3.1 = 47630.65, b5-lm2.1=21029.58

Sector 7, Multiple High Losses near the triplet magnet: b7-lm3.1=4617.85, b7-lm2.1=47929.86,  
g7-lm1=4859.70, b7-lm0=4632.09

Sector 8, HIGHEST LOSSES: b8-lm2.1=3790.99, b8-lm3.1=4918.69, b8-lm3.2=47985.35, b8-lm4= 2430.25,  
g8-lm5=4533.78, g8-lm6=2248.02

Main Magnet Power Status: Sitting at Store Energy

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** Postmortems show no evidence of a power supply fault, however there are several indications of beam induced quenches as seen from previous examples. High levels of radiation losses throughout the ring also indicate that something had gone wrong with the beam abort. See comments below for details. *G. Heppner.*

Blue quench link trip was caused by 8b-qd1-quench detector. The quench detector tripped because of a real magnet quench at B7QFQ3\_VT. The beam permit tripped .586 sec before the quench link. There were real magnet quenches at b7q3, b7q2, b7q1, b7d0 and b5q3. There were high beam losses at b7-lm3.1, b7-lm2.1, b7-lm0, and g7-lm1 which did not occur until approx. 0.5 sec after the beam permit tripped. Also y7-tq4, y7-tq5, y7-tq6, bi5-th3, bo7-qs3, bo7-tv3, and bo7-th2 quenched. There is now 9 beam induced quenches for this run. There were no problems with any power supply prior to the quench. -Ganetis

#### **Physics / MCR:**

Clearly, the abort kicker never ramped! So, when the permit got pulled because of the excessive loss at b7-lm3.1, it was a really nasty dump. -Mei, Todd, Vadim, Jenn, We'll have to investigate the sequencer on this one; I was worried that someone had clicked through a warning on this (since we had no yellow beam in the machine), but that doesn't appear to be the case from Sequencer logs. If not, we'll have to add a check on abort kicker voltage to the Up() sequence -- this should be easy to do since there is already one for the Down() sequence. -TJS I've added abort kicker voltage checks to the Up() sequence. These checks are performed only for beams that have >1e9 ions on the DCCT at the time of the Up() sequence. -TJS

b7-lm3.1 is the only blm saw beam losses more than a second before beam got aborted. Vadim found on the Alarm, bo7-qs3, bi5-th3, bo7-tv3 and bo7-th2 had over voltage warning. Vadim also confirmed that bo7-tv3 is in standby error on the psall. We need George to confirm whether this is true that the beam loss at bt-lm3.1 was due to the trip of bo7-tv3. -Mei, Vadim Actually it seems that these power supplies tripped 1sec after abort event. -VP

Further investigation into the RHIC abort kicker situation that caused the blue quench at 0134... It turns out that a beam abort event had occurred before the ring was filled and ramped. The abort kickers do not recharge after a beam abort event occurs. In this case, the beam abort event occurred, and then presumably the ring was filled without a cogging reset being issued in RHIC Injection (which should have recharged the abort kickers.) -jak This was also exacerbated by filling manually, so RhicInjection did not issue cogging resets that it normally does with a Fill Both. -TJS

QLI Recovery TAPE Start: 02:16:12      Link Recovered Time: 02:30:56      Estimated Down Time: 57 minutes

**Quench Analysis: Beam Induced Quench #009**

**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Wednesday-January 19, 2005: PR-012, Yellow Quench: File# = 1106116465***

Permit ID: 8b-ps1      Timestamp: 01:34:24 +1512592      Beam Permit Fail Timestamp: 01:34:24 +730499

QPAControl / Timing Resolver: No faults indicated, b-QD, QLI and y-QD QLI first to register.

Quench Detector(s) Trip: 8b-qd2, Y7DRD0\_D0, Int. 1, Tq -23

5 Minute: Quench Delay File: (see Blue Quench above)

Beam Loss Monitors (Rads/Hr): Scattered Beam throughout the machine, BLM show most losses after T=zero except for b7-lm3.1 where losses begin to rise 2.5 seconds before T=zero.

Main Magnet Power Status: Sitting at Store Energy

**Technical Notes / Sequence of Events:** This Quench Event occurred 0.206 seconds after the Blue 8b-ps1 Event (PR-012 previous page). See George's analysis below for cause. *G. Heppner*

Yellow quench link trip was caused by 8b-qd2-quench detector. The quench detector tripped because of magnetic coupling between the B7D0 and Y7D0 magnets. When the B7D0 had a real quench it induced a voltage into the Y8D0 magnet that the yellow quench detector interprets as quench. -Ganetis

QLI Recovery TAPE Start: 02:31:39      Link Recovered Time: 02:39:49      Estimated Down Time: 66 minutes

**Quench Analysis: Beam Induced Quench #009**

**(Counter = Beam Induced)**

***Wednesday-January 19, 2005: PR-013, Blue Quench: File# = 1106123713***

Permit ID: 2b-ps1      Timestamp: 03:35:12 +1654665      Beam Permit Fail Timestamp: 03:35:12 +1654694

QPAControl / Timing Resolver: No faults indicated, b-QD, QLI first to register.

Quench Detector(s) Trip: 2b-qd1, B1QFQ2\_VT, Int.1, Tq - 24

5 Minute: Quench Delay File: No indications, systems running.

Beam Loss Monitors (Rads/Hr): Indicate a proper abort had taken place at dump station 10.

Main Magnet Power Status: Injection Current.

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** Postmortems are showing several supplies with current and even Iref spikes prior to the trip with b2-q6-ps indicating the worst. *G. Heppner*

Blue quench link trip was caused by 2b-qd1-quench detector. The quench detector tripped because of a problem with b2-q6-ps. The p.s. has large current spikes that cause the quench detector to trip. -Ganetis

Physics / MCR: Only one bunch in machine while setting up for BBA development. Had just turned on the PLL amplifiers, but that's the only correlated thing that happened. -TJS

QLI Recovery TAPE Start: 03:40:08      Link Recovered Time: 03:51:52      Estimated Down Time: 17 minutes

**Quench Analysis: b2-q6-ps producing large current spikes.**

**(Counter = IR Power Supply)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

#### **Wednesday-January 19, 2005: PR-014, Blue Quench: File# = 1106125669**

Permit ID: 4b-time.A      Timestamp: 04:07:48 +1771872      Beam Permit Fail Timestamp: 04:07:48 +1771902

QPAControl / Timing Resolver: No faults indicated, b-B1, QLI and b-B1 QLO first to register.

Quench Detector(s) Trip: All quench Detectors fired indicating positive Tq values.

5 Minute: Quench Delay File: No indications, systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Ramping from Park to Injection, tripping at the following currents:

BDMC = 400.10amps and BQMC = 367.17amps

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** No indications of a power supply at fault, this fault occurred after a Hysteresis Loop was performed. *G. Heppner*

Blue quench link trip was caused by a bad connection on a quench link interlock cable between the B1 QPAIC and A2 QPAIC in service bldg. 1004B. -Ganetis

QLI Recovery TAPE Start: 04:15:55      Link Recovered Time: 04:27:15      Estimated Down Time: 19minutes

#### **Quench Analysis: Possible loose K-lock Connection**

**(Counter = Other)**

#### **Wednesday-January 19, 2005: PR-015, Blue Quench: File# = 1106127216**

Permit ID: 2b-ps1      Timestamp: 04:33:36 +804885      Beam Permit Fail Timestamp: 04:33:36 +804914

QPAControl / Timing Resolver: No faults indicated, b-QD, QLI first to register.

Quench Detector(s) Trip: 2b-qd1, B1QFQ2\_VT, Int.1, Tq - 24

5 Minute: Quench Delay File: No indications, systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Ramping from Injection to Store, tripping at the following currents:

BDMC = 673.47amps and BQMC = 639.53amps

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:** Postmortems show large Current Spikes in consecutive time order indicated on b2-q6-ps with the largest up to 85 amps. Other supplies mirror smaller spikes in the same time frame. Consulting with George, due to the large spike, it appears there may be possible coupling interference in the MADDC signal cables going to the controls rack in the service build control room. Reference to PR-013, *G. Heppner*

Blue quench link trip was caused by 2b-qd1-quench detector. The quench detector tripped because of a problem with b2-q6-ps. The p.s. has large current spikes that cause the quench detector to trip. -Ganetis [quench]

**Physics / MCR:** With the repeated QLI from 2 o'clock, we've called Don Bruno to investigate, since spikes in b2-q6-ps.current look like a loose connector or some sort of thermal-driven transient. -TJS, JLN, JAK, Christoph. Don is continuing to investigate 2 o'clock QLI, and is awaiting CAS support to help, but they are going through shift change and then are required to assist with AGS LOTO as well. Looks like two ramps with beam are all that we got for the evening. There were no ramp changes for the beam experiments tonight, so I have not restored any previous settings in the ramp manager for now. I'm back on owl shift later tonight, so we'll revert ramp settings if necessary with beam post-maintenance. -TJS

I am coming in to look at b2-q6 (2 QLI's) and other QLI at 4b since maintenance starts soon. I think b2-q6 was the source of the 2 QLI's at 2b after looking at the Postmortems. 4b looks like it might be a loose k-lock connector but I will have to confirm with Wing Louie. -Don Bruno [rhic] [ps]

QLI Recovery TAPE Start: 04:45:15      Link Recovered Time: 04:56:53      Estimated Down Time: 24 minutes

#### **Quench Analysis: b2-q6-ps producing large current spikes.**

**(Counter = IR Power Supply)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

**Scheduled Maintenance 07:00 to 24:00**

**Wednesday-January 19, 2005: PR-016, Blue and Yellow Quench Files:**

**File# = 1106136003**      **Permit ID: Blue: 4b-time.A**      **Timestamp: 07:00:00 +3365643**

Cause:

**File# = 1106143181**      **Permit ID: Yellow: 10a-ps3.A**      **Timestamp: 08:59:40 +1444112**

Cause: yo9-qf2-ps put into the off state.

Main Magnet Power Status: Zero Currents.    DX Heaters: None fired.

**Technical Notes / Sequence of Events:**

RHIC ps Maintenance performed: 1. Replaced node card cable for yi2-tv12. 2. Ran snakes up to 10A, except for one that has a fan fault. 3. Fixed the problem with 2 other snakes that would not come on. 4. Replaced yi10-qd6 and yo8-qd1 current regulator cards. 5. Fixed problem with 10A bypass box showing the wrong status. 6. Ran a new k-lock cable at 4b that may have been causing 4b.time A trips earlier this morning. -Don Bruno [rhic] [ps]

Turned over the machine to MCR at 22:00 hours, let Science resume! *G. Heppner*

Blue Recovery TAPE Start: 20:12:41      Link Recovered Time: 20:21:56      Down Time for Blue: 802 minutes

Yellow Recovery TAPE Start: 19:59:50      Link Recovered Time: 20:10:13      Down Time for Yellow: 670 minutes

**Quench Analysis: Scheduled Maintenance**

**(Counter = Maintenance)**

**Thursday-January 20, 2005: PR-017, Blue Quench: File# = 1106204505**

Permit ID: 12a-ps1.A      Timestamp: 02:01:44 +1313237      Beam Permit Fail Timestamp: 02:01:44 +1313267

QPACControl / Timing Resolver: No faults indicated, QP05-R12AQD1-bi12-qf9-qp first to register..

Quench Detector(s) Trip: 12a-qd1 only one to indicate showing B12QDQ9\_VT, Int. 1, Positive Tq Value of 1885.

5 Minute: Quench Delay File: No indications, systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Zero Currents

DX Heaters: Did not fire.

**Technical Notes / Sequence of Events:**

No indications of a power supply at fault, all are sitting at zero currents. MCR had seen a potential problem with bi12-qf9-ps during several of previous captured Snapramp Data Stores. Even though this supply did not trip and cause a QLI, confirmation that there is a problem with this supply, they called Don for assistance. *G. Heppner*

bi12-qf9-ps were quite noisy at the top of the ramp. Since CAS was busy I decided to try and put the p.s. into the OFF state. I waited about 5 minutes. Then I recovered the blue link and did two hysteresis ramps. It looks much better. The ramps were done at 2:41 and 2:52 if anyone wants to take a look at bi12-qf9-ps. Tim Costanzo of CAS is set up with a new current regulator card if this problem comes back. The p.s.'s all have to be ramped to zero by MCR. Then call Tim. Tim will put bi12-qf9-ps into the OFF state and this will bring the blue link down. He will swap out the card and then hand it back to MCR. MCR can recover and ramp. If this still does not fix the problem then give me another call. -Don Bruno

QLI Recovery TAPE Start: 02:07:59      Link Recovered Time: 02:24:46      Estimated Down Time: 23 minutes

**Quench Analysis: Operator observation of bi12-qf9-ps**

**(Counter = IR Power Supply)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Friday-January 21, 2005: PR-018, Yellow Quench: File# = 1106304626***

***Permit ID: 10a-ps3.A      Timestamp: 05:50:24 +2416635      Beam Permit Fail Timestamp: 05:50:24 +2296142***

***QPAControl / Timing Resolver: y-A2 QLI first, no faults indicated.***

***Quench Detector(s) Trip: 10a-qd2, Y9QFQ6\_4VT, Int. 1, Tq -25***

***5 Minute: Quench Delay File: (10a-qd2) Y9QFQ6\_4VT***

***Beam Loss Monitors (Rads/Hr): Sector 9 Dump appears dirty. High losses beyond the normal levels past dump station:***

***g9-lm12=3152.58, g9-lm10=1913.83, g9-lm8=1232.62, g9-lm7=2380.32,***

***g9-lm6=2638.09, g9-lm5=4749.74, g9-lm4=4651.32***

***Main Magnet Power Status: Store Energy: YDMC = 4309.07 and YQMC = 4016.51***

***y-qmain-ps, Current Monitor***

***Technical Notes / Sequence of Events:*** Analysis show that power supplies had not caused this event. *G. Heppner*

Yellow quench link trip was caused by 10a-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y6QFQ6\_4VT. The beam permit tripped .120 sec. before the quench link. There was a real magnet quench at y9q4. There was a high beam loss at y9-lm4 after the permit trip. There is now 10 beam induced quenches for this run. There were no problems with any power supply prior to the quench. -*Ganetis*

***Physics Log:*** Physics ran for 6.6 hours this shift in two stores. The first began on the previous shift and was dumped after 4.3 hours due to excessive blue de-bunched beam levels. The second store was not re-bucketed but did have continuous gap cleaning on; it was aborted by a quench in yellow when y09-qf2 voltage jumped. RF experts need to investigate the re-bucketing process during the day. LISA continues to cause a jump in the main quad current; steering must be performed by orbit bumps via RHIC Orbit program.

***QLI Recovery TAPE Start: 06:10:36***

***Link Recovered Time: 06:19:49***

***Estimated Down Time: 29 minutes***

***Quench Analysis: Beam Induced quench #010***

***(Counter = BI)***

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

#### ***Friday-January 21, 2005: PR-019, Yellow Quench: File# = 1106327762***

Permit ID: **8b-ps1**      Timestamp: **12:16:00 +2288089**      Beam Permit Fail Timestamp: 12:16:00 +2288119

QPAControl / Timing Resolver: y-QD QLI first, no faults indicated

Quench Detector(s) Trip: 8b-qd2, Y7QFQ3\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 6b-qd2, Y6QFQ3\_VT

8b-qd2, Y7QFQ3\_VT and Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr): It appears that beam had been scattered throughout the machine!

Listed are peak values near the magnets that actually quenched. There are high levels in other areas too.

*Sector 7:* y7-lm3.2=4542.86 more then ½ second, b7-lm3.1=3942.04, y7-lm3.1=4655.23 ½ second

*Sector 8:* y8-lm2.1 = 46185.34, b8-lm2.1 = 45005.52, y8-lm3.1 = 8920.86, g8-lm1 = 4449.92, y8-lm0 = 4804.95

*Sector 6:* y6-lm2.1 = 17170.45, y6-lm3.1 = 4600.81, g6-lm1 = 4599.40

Main Magnet Power Status: Store Energy: YDMC = 4309.07 and YQMC = 4016.51

**Technical Notes / Sequence of Events:** Yellow quench link trip was caused by 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y7QFQ3\_VT. The beam permit tripped after the quench link. There were real magnet quenches at y6q3, y7q3 and y8q3. Also y08-th2 and y16-th3 also quenched after the main magnets do to warm gas. There were high beam losses at these magnet location before the beam permit tripped. There were no problems with any power supply prior to the quench. The blue ring also had real magnet quenches due to beam loss. There is now 11 beam induced quenches for this run. -Ganetis

**Physics Log:** Without even looking I'm guessing that the cause of the quench was that the Abort Kickers were not set up properly, contrary to what we were told. Cryo saw a heat load in both Rings. -JPJ We received the alarm indicating that a Yellow dirty dump occurred, so I'm guessing that Blue tripped due to cross talk. -JPJ The sequencer didn't catch this because it's not supposed to catch this -- the abort kickers were at set voltage, but set voltage was unfortunately low. -TJS Dump systems left with a switch in "local reference" position. Not computer readable. Obvious enough in retrospect. -leif

The word from Pulsed Power...The initial work to correct the Yellow Abort Kicker redundant trigger problem was not successful. They are going back in the tunnel now to possibly swap out the combiner chassis. -JPJ

QLI Recovery TAPE Start: **12:57:38**      Link Recovered Time: **13:05:15**      Estimated Down Time: **49 minutes**

**Quench Analysis: Beam Induced quench #011(Counter = BI)**

#### ***Friday-January 21, 2005: PR-019, Blue Quench: File# = 1106327762***

Permit ID: **12a-ps1.A**      Timestamp: **12:16:00 +2332080**      Beam Permit Fail Timestamp: **12:16:00 +2288101**

QPAControl / Timing Resolver: b-QD QLI first, no faults indicated

Quench Detector(s) Trip: 12a-qd1, B11QFQ2\_VT, Int. 1, Tq - 24

5 Minute: Quench Delay File: 11b-qd1, B10DSA4\_A3VT, 12a-qd1, B11QFQ2\_VT

Beam Loss Monitors (Rads/Hr): It appears that beam had been scattered throughout the machine!

Listed are peak values near the magnets that actually quenched. There are high levels in other areas too.

*Sector 11:* b11-lm3.1 = 4569.16, y11-lm3 = 3181.04, g11-lm1 = 4706.53, b11-lm0 = 4914.57

Main Magnet Power Status: Store Energy: YDMC = 4309.07 and YQMC = 4016.51

**Technical Notes / Sequence of Events:** Blue quench link trip was caused by 12a-qd1-quench detector. The quench detector tripped because of a real magnet quench at B11QFQ2\_VT. The beam permit tripped after the quench link. There were real magnet quenches at b10d20 and b11q2. Also b010-th20 and b011-th2 also quenched after the main magnets do to warm gas. There were high beam losses at these magnet location before the beam permit tripped. There were no problems with any power supply prior to the quench. The yellow ring also had real magnet quenches due to beam loss. There is now 11 beam induced quenches for this run. -Ganetis

QLI Recovery TAPE Start: **12:48:31**      Link Recovered Time: **12:55:59**      Estimated Down Time: **40 minutes**

**Quench Analysis: Beam Induced quench #011 (Counter = BI)**



***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Friday-January 21, 2005: PR-020, Yellow Quench: File# = 1106331235***

Permit ID: 10a-ps3.A    Timestamp: 13:13:52 +3037597    Beam Permit Fail Timestamp: Still down from 12:16:00  
QPAControl / Timing Resolver: QP04-R10QD4-yi10-q89-qp (fan)  
Quench Detector(s) Trip: None, systems running.  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

**Technical Notes / Sequence of Events:** Link failed after recovering from previous quench (PR-019). Replaced two fan switches for yi10-q89-qpa. Tested and returned operations back over to MCR. *G. Heppner*

QLI Recovery TAPE Start: 14:09:10    Link Recovered Time: 14:16:36    Estimated Down Time: 63 minutes

***Quench Analysis: yi10-q89-qpa Fan Switches (2)***  
**(Counter = QPA)**

***Sunday-January 23, 2005: PR-021, Yellow Quench: File# = 1106484026***

Permit ID: 4b-time.B    Timestamp: 07:40:24 +2314405    Beam Permit Fail Timestamp: 07:40:24 +2295896  
QPAControl / Timing Resolver: No faults listed, y-BP RDY first to trip.  
Quench Detector(s) Trip: All tripped on Positive Tq values.  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): No beam in the machine at this time. Beam dump at 06:17:37.  
Main Magnet Power Status: Injection Current.

**Technical Notes / Sequence of Events:** MCR reported a power dip had occurred. I checked the 208vac Phase Monitors and saw that all the buildings suffered a line loss of 8 cycles, dropping to 230vac. This caused an undervoltage to the mains, causing them to trip. *G. Heppner*

QLI Recovery TAPE Start: 08:52:34    Link Recovered Time: 09:01:05    Estimated Down Time: 81 minutes

***Quench Analysis: Power Dip***  
**(Counter = Power Dip)**

***Sunday-January 23, 2005: PR-021, Blue Quench: File# = 1106484026***

Permit ID: 4b-time.B    Timestamp: 07:40:24 +2333880    Beam Permit Fail Timestamp: 07:40:24 +2295896  
QPAControl / Timing Resolver: No faults listed, b-BP RDY first to trip.  
Quench Detector(s) Trip: All tripped on Positive Tq values.  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): No beam in the machine at this time. Beam dump at 06:17:52.  
DX Heaters: No indications that any fired.  
Main Magnet Power Status: Injection Current.

**Technical Notes / Sequence of Events:** MCR reported a power dip had occurred. I checked the 208vac Phase Monitors and saw that all the buildings suffered a line loss of 8 cycles, dropping to 230vac. This caused an undervoltage to the mains, causing them to trip. *G. Heppner*

QLI Recovery TAPE Start: 08:30:15    Link Recovered Time: 08:44:13 User Invoked, Cancelled

***Quench Analysis: Power Dip***  
**(Counter = Power Dip)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Sunday-January 23, 2005: PR-022, Blue Quench: File# = 1106487566***

Permit ID: 4b-time.B      Timestamp: 08:39:24 +2917960      Beam Permit Fail Timestamp: 07:40:24 +2295896

QPACControl / Timing Resolver: No faults listed, b-BP RDY first to trip.

Quench Detector(s) Trip: None indicated, all systems running.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time. Beam dump at 06:17:52.

DX Heaters: No indications that any fired.

Main Magnet Power Status: Zero Currents. Regulator Off for the b-dmain.

**Technical Notes / Sequence of Events:** Postmortems show no power supplies faults, all at zero currents. However, User Invoked had been initiated when recovering from the power dip (PR-021) because the Blue Main Dipole would not run up to Park Current, Regulator Off fault for the b-dmain. TAPE was reinitiated to bring up the Blue Link. *G. Heppner*

OLI Recovery TAPE Start: 08:44:15      Link Recovered Time: 08:52:23      Estimated Down Time: 82 minutes

***Quench Analysis: Blue Main Dipole Failed to recover, Reg Off. (TAPE Network)***

**(Counter = Main Power Supplies)**

***Sunday-January 23, 2005: PR-023, Yellow Quench: File# = 1106525797***

Permit ID: 4b-time.A      Timestamp: 19:16:36 +1339084      Beam Permit Fail Timestamp: 19:16:36 +1339114

QPACControl / Timing Resolver: No faults listed, QP03-R4BYQF2-yi3-qd2-qp first to trip.

Quench Detector(s) Trip: None indicated, all systems running.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time. Beam dump at 13:20:51.

Main Magnet Power Status: Park Current.

**Technical Notes / Sequence of Events:** yi3-qd2-ps, Stby-Error, AC Power, Standby, Remote, DC Overcurrent, Quench, FET, AC Phase. Found nothing wrong, MCR reset and the supply has been running since. *G. Heppner*

OLI Recovery TAPE Start: 19:25:35      Link Recovered Time: 19:36:07      Estimated Down Time: 19 minutes

***Quench Analysis: Power Supply yi3-qd2-ps (150amp Suncraft)***

**(Counter = IR Power Supply)**

***Monday-January 24, 2005: PR-024, Yellow Quench: File# = 1106600834***

Permit ID: 4b-time.A      Timestamp: 16:07:12 +2298055      Beam Permit Fail Timestamp: 16:05:52 +1110763

QPACControl / Timing Resolver: No faults listed, QP03-R4BYQF2-yi3-qd2-qp first to trip.

Quench Detector(s) Trip: All tripped indicating positive Tq values.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.

Main Magnet Power Status: Injection Current.

Start 16:30 end 17:48, delay because they had to dig their way into the building 1004B.

**Technical Notes / Sequence of Events:** Power Supply yi3-qd2 was replaced during Experimenter down time. Notice, Heavy snow conditions from the weekend storm caused Technicians to delay replacement due to improper clearance into the building. *G. Heppner*

OLI Recovery TAPE Start: 17:48:50      Link Recovered Time: 17:58:41      Estimated Down Time: 112 minutes

***Quench Analysis: Power Supply yi3-qd2-ps (150amp Suncraft)***

**(Counter = IR Power Supply)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

#### **Monday-January 24, 2005: PR-025, Blue Quench: File# = 1106607045**

Permit ID: 12a-ps1.A    Timestamp: 17:50:44 +1105404    Beam Permit Fail Timestamp: 16:05:52  
QPAControl / Timing Resolver: No faults indicated  
Quench Detector(s) Trip: 1b-qd1, B12DSA4\_A3VT, Int. 100, Tq -24  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): No beam in the machine at this time.  
DX Heaters: No indications that any fired.  
Main Magnet Power Status: Injection current, ramping down, tripping at BDMC = 451.09amps, BQMC = 424.55amps.

**Technical Notes / Sequence of Events:** This QLI was my fault. I used wfgman to do a here2zero from injection, which doesn't default to the right Slowfactor. -JPJ

QLI Recovery TAPE Start: 18:01:00    Link Recovered Time: 18:08:25    Estimated Down Time: 18 minutes

**Quench Analysis: Wrong Slowfactor during ramp down.**  
**(Counter = Operator Error)**

#### **Tuesday-January 25, 2005: PR-026, Blue Quench: File# = 1106674890**

Permit ID: 4b-time.A    Timestamp: 12:41:28 +2881025    Beam Permit Fail Timestamp: 12:41:28 +2875312  
QPAControl / Timing Resolver: No faults listed.  
Quench Detector(s) Trip: All tripped on Positive Tq values.  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): Beam Dump appears to be a normal condition.  
DX Heaters: 4b-ps4.A1, 4b-ps4.B2, 10a-ps3.B2 fired.  
Main Magnet Power Status: Injection Current.

**Technical Notes / Sequence of Events:** QP02-R01B04-bi1-sxf-qp, Crowbar, cfe-1b-ps2

QLI Recovery TAPE Start: 14:22:35    Link Recovered Time: 14:30:45    Estimated Down Time: 109 minutes

**Quench Analysis: Power Dip**  
**(Counter = Power Dip)**

#### **Tuesday-January 25, 2005: PR-026, Yellow Quench: File# = 1106674890**

Permit ID: 4b-time.B    Timestamp: 12:41:28 +2917586    Beam Permit Fail Timestamp: 12:41:28 +2875312  
QPAControl / Timing Resolver: No faults listed.  
Quench Detector(s) Trip: All tripped on Positive Tq values.  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): Beam Dump appears to be a normal condition.  
Main Magnet Power Status: Injection Current.

**Technical Notes / Sequence of Events:** QP02-R03B07-yi3-sxd-qp, Crowbar, cfe-3b-ps2    "Lights blinked, RHIC went down." Major Power Dip, 208vac Service Building Phase Monitors indicate a line loss of 3 cycles, dropping to 157vac before recovering. This caused multiple systems to go down including the mains to trip because there is no UPS system used on the main 480vac lines. *G. Heppner*

12:42 We just had a power dip (\*&^^%\$#@!> -kad

13:16 This power dip took out all experimental magnets, AMMPS, BMMPS, all RF, QLI both rings, and took down ATR supplies. Operations is working to clear, but this will take a long time to clear as it was a very bad power dip -- Cryo is also taking time to recover. -TJS, LH, JLN, BSB

QLI Recovery TAPE Start: 14:31:28    Link Recovered Time: 14:39:11    Estimated Down Time: 117 minutes

**Quench Analysis: Power Dip**  
**(Counter = Power Dip)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

**Tuesday-January 25, 2005: PR-027, Blue Quench: File# = 1106683918**

Permit ID: 4b-time.A    Timestamp: 15:11:56 +2238896    Beam Permit Fail Timestamp: down from previous QLI  
QPAControl / Timing Resolver: QP06-R4BOFF1-b-qtrim-qp first trip, no faults indicated.  
Quench Detector(s) Trip: All tripped indicating positive Tq values  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): No beam in the machine at this time. Beam dump at 06:17:52.  
DX Heaters: No indications that any fired.  
Main Magnet Power Status: Ramping to injection: BDMC = 472.94 amps, BQMC = 463.99 amps.

**Technical Notes / Sequence of Events:** Wfg tried to ramp the supply in the negative direction. This supply cannot ramp negative and therefore with no change in current, the supply tripped on error signal. It turns out Al Murusic set in a negative ramp value. *G. Heppner*

When activating ramp at injection before a hysteresis cycle. Looks like injection tune settings are screwed up, which is probably the root cause. Will recover again. The root cause for this was Al testing settings through cdev and not realizing that these changes were being made live just as we were activating. -TJS

As discussed by phone: software tests with the potential of affecting beam operations must be planned and scheduled - Fulvia

QLI Recovery TAPE Start: 15:19:53    Link Recovered Time: 15:27:33    Estimated Down Time: 16 minutes

**Quench Analysis: Experimental Ramp used for b-qtrim-ps (Negative Ramp)**  
**(Counter = Controls Related)**

**Tuesday-January 25, 2005: PR-028, Blue Quench: File# = 1106685034**

Permit ID: 4b-time.A    Timestamp: 15:30:32 +2036009    Beam Permit Fail Timestamp: 15:30:32 +2036038  
QPAControl / Timing Resolver: QP06-R4BOFF1-b-qtrim-qp first trip, no faults indicated.  
Quench Detector(s) Trip: No trips, all systems running.  
5 Minute: Quench Delay File: None indicated, systems running.  
Beam Loss Monitors (Rads/Hr): No beam in the machine at this time. Beam dump at 06:17:52.  
DX Heaters: No indications that any fired.  
Main Magnet Power Status: Ramping to injection: BDMC = 134.07 amps, BQMC = 137.50 amps.

**Technical Notes / Sequence of Events:**

Again, the wfg tried to ramp the supply in the negative direction. This supply cannot ramp negative and therefore with no change in current, the supply tripped on error signal. MCR is going to change ramp settings. *G. Heppner*

The wfg manager had not been updated with the reverted ramp, because we had not activated -- hence the wfg manager still had bad setpoints in it during quench recovery's 'here2first' step. We activated the good (reverted) ramp at zero, and ops are recovering again. -TJS, JPJ

Don also found that the b-dmain was oscillating around the time of the last QLI. While this did not cause the trip, he thought that it was worth passing on to Carl. -JPJ, Al, Don

QLI Recovery TAPE Start: 15:53:09    Link Recovered Time: 16:01:03    Estimated Down Time: 30 minutes

**Quench Analysis: Experimental Ramp used for b-qtrim-ps (Negative Ramp)**  
**(Counter = Controls Related)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Thursday-January 27, 2005: PR-029, Blue Quench: File# = 1106824892***

Permit ID: 10a-ps3.A    Timestamp: 06:21:32 +81341    Beam Permit Fail Timestamp: 06:21:32 +81370

QPAControl / Timing Resolver: b-qd first to trip, no faults indicated.

Quench Detector(s) Trip: 10a-qd1, B9QFQ6\_4VT, Int. 1, Tq -25, all others tripped indicating positive values.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): Appears a proper Beam Dump had occurred for Blue.

DX Heaters: No indications that any fired.

Main Magnet Power Status: At Injection, tripping at the following: BDMC = 472.94 amps, BQMC = 445.229 amps

**Technical Notes / Sequence of Events:** Postmortems show no problem with bi9-qd6 prior to T=zero. However, the signals don't seem to return to zero base line after the trip. Qdplots show the 4-20mA signal failing to the Negative Rail and staying there. *G. Heppner*

QLI Recovery TAPE Start: 06:24:27    Link Recovered Time: User Invoked / Cancel / Exit at 06:28:07

**Quench Analysis: bi9-qd6-ps (Reference to PR-032)**

**(Counter = IR Supplies)**

***Thursday-January 27, 2005: PR-030, Blue Quench: File# = 1106825845***

Permit ID: 10a-ps3.A    Timestamp: 06:37:24 +1065777    Beam Permit Fail Timestamp: 06:37:24 +1065806

QPAControl / Timing Resolver: b-qd first to trip, no faults indicated.

Quench Detector(s) Trip: 10a-qd1, B9QFQ6\_4VT, Int. 1, Tq -25, all others cleared.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): No Beam in the machine.

DX Heaters: No indications that any fired.

Main Magnet Power Status: The BQMC = 0 amps; BDMC = 0 amps then spiking to 38.41 amps before returning to 0.

**Technical Notes / Sequence of Events:** Postmortems show Iref = 30.08, Current = 20.50 amps, Voltage = 462.50mV and Error = 708.86mV. Checking Pet page for the actual power supply, the signals appear to match but this can't be because the supply is in the Standby / Error state. Quench Detection Signal indicates a -401 Amps. Qdplots show the 4-20mA signal has never recovered from the Negative Rail. It also appears as seen below that MCR had no luck with the Link Recovery. This is because the 10-qd1 Quench Detector would not clear. *G. Heppner*

QLI Recovery TAPE Start: 06:31:57

Link Recovered Time: 06:43:47 User Invoked Cancel

06:44:05 Starts with b-dmain ON

06:44:41 Pause

06:44:53 Resume

06:45:22 Pause

06:45:23 Cancel

**Quench Analysis: bi9-qd6-ps (Reference to PR-032)**

**(Counter = IR Supplies)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Thursday-January 27, 2005: PR-031, Blue Quench: File# = 1106826681***

Permit ID: 10a-ps3.A    Timestamp: 06:51:20 +1099327    Beam Permit Fail Timestamp: 06:51:20 +1099356

QPAControl / Timing Resolver: b-qd first to trip, no faults indicated.

Quench Detector(s) Trip: 10a-qd1, B9QFQ6\_4VT, Int. 1, Tq -25, all others cleared.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): No Beam in the machine.

DX Heaters: No indications that any fired.

Main Magnet Power Status: The BQMC = 0 amps; BDMC = 0 amps then spiking to 24.81amps before returning to 0.

**Technical Notes / Sequence of Events:** Postmortems show Iref = 30.08, Current = 20.50 amps, Voltage = 462.50mV and Error = 708.86mV. Quench Detection Signal still indicates a -401 Amps. Qdplots show the 4-20mA signal still has not recovered from the Negative Rail. The Main Power Supplies unable to turn on, the Link would not recover because the 10-qd1 Quench Detector still did not clear. *G. Heppner*

QLI Recovery TAPE Start: 06:45:26

Link Recovered Time: 06:59:24 User Invoked Cancel

07:12:02, 07:17:19 step 61 of b-dmain, Paused due to an error.

***Quench Analysis: bi9-qd6-ps (Reference to PR-032)***  
***(Counter = IR Supplies)***

***Thursday-January 27, 2005: PR-032, Blue Quench: File# = 1106828308***

Permit ID: 10a-ps3.A    Timestamp: 07:18:28 +98111    Beam Permit Fail Timestamp: 07:18:28 +98140

QPAControl / Timing Resolver: b-qd first to trip, no faults indicated.

Quench Detector(s) Trip: 10a-qd1, B9QFQ6\_4VT, Int. 1, Tq -25, all others cleared.

5 Minute: Quench Delay File: None indicated, systems running.

Beam Loss Monitors (Rads/Hr): No Beam in the machine.

DX Heaters: No indications that any fired.

Main Magnet Power Status: The BQMC = 0 amps; BDMC = 0 amps then spiking to 27.58amps before returning to 0.

**Technical Notes / Sequence of Events:** Postmortems show Iref = 30.08, Current = 20.50 amps, Voltage = 462.50mV and Error = 708.86mV. Quench Detection Signal still indicates a -401 Amps. Qdplots show the 4-20mA signal still has not recovered from the Negative Rail. The Main Power Supplies unable to turn on, the Link would not recover because the 10-qd1 Quench Detector still did not clear. The Buffer Card was exchanged because the -15volt, V2 light was not lit on the front of the card. Signals seen as described above are a good indication of this problem. *G. Heppner*

QLI Recovery TAPE Start: 08:31:28

Link Recovered Time: 08:38:50

Estimated Down Time: 131 minutes

***Quench Analysis: bi9-qd6-ps Buffer Card, shorted C-76 Capacitor loading down the -15v***  
***(Counter = IR Supplies)***



## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of January 2005***

***Thursday-January 27, 2005: PR-033, Blue Quench: File# = 1106856820***

Permit ID: 8b-ps1      Timestamp: 15:13:40 +60115      Beam Permit Fail Timestamp: 15:13:40 +50641  
QPAControl / Timing Resolver: No qpa Faults listed, b-QD First to trip.  
Quench Detector(s) Trip: 8b-qd1, B8QFQ2\_VT, Int. 1, Tq -24  
5 Minute: Quench Delay File: 8b-qd1 B8QFQ2\_VT  
Beam Loss Monitors (Rads/Hr): b8-lm2.1 = 14754.51 averaging over 1000 during the 10 second data envelope.  
b8-lm3.2 = 23882.81 averaging over 2000 during the 10 second data envelope  
DX Heaters: No indications that any fired.  
Main Magnet Power Status: Mains had just approached Top Energy Store when tripping.  
BDMC = 4308.38 amps, BQMC = 4008.88 amps

***Technical Notes / Sequence of Events:*** At 15:28:00 Cryo reported that the DX magnet in 8 o'clock quenched, and they are waiting for temperatures to stabilize. There was no indication of a DX Magnet quench that I could see. There was no indication of a power supply at fault prior to the quench. A blue quench link trip was caused by the 8b-qd1-quench detector. The quench detector tripped because of a real magnet quench at B8QFQ2\_VT. The beam permit tripped .009 sec. before the quench link. There was a real magnet quench at b8q2. There was high beam loss at b8-lm2.1 and b8-lm3.2. There are now 12 beam induced quenches for this run. *G Heppner*

***Physics Log:*** Octupoles are 0. Total RF voltage at the transition was 100kV in Yellow and 200kV in Blue. Transition looks great. The instability happened again in 't92' this time in Blue. The Blue emittance was blown up which led to the slow losses during the beta-squeeze. Loss was enough to quench 8 o'clock triplet quad. -VP,Jie,Haixin

QLI Recovery TAPE Start: 15:55:55      Link Recovered Time: 16:03:55      Estimated Down Time: 42 minutes

***Quench Analysis: Beam Induced Quench #012***  
***(Counter = Beam Induced)***

***Friday-January 28, 2005: PR-034, Blue Quench: File# = 1106891329***

Permit ID: 6b-ps1      Timestamp: 00:48:48 +1254623      Beam Permit Fail Timestamp: 00:48:48 +1235275  
QPAControl / Timing Resolver: No qpa Faults listed, b-QD First to trip.  
Quench Detector(s) Trip: 6b-qd1, B5QFQ2\_VT, Int. 1, Tq -24  
5 Minute: Quench Delay File: 6b-qd1, B5QFQ2\_VT  
Beam Loss Monitors (Rads/Hr): y5-lm3.2 = 2100 averaging over the 10 second data envelope.  
b5-lm2.1 = 39472.40 peak, averaging 1450 in the 10 second data envelope.  
g5-lm1 = 2566.23 peak, losses seen in sector 6 as well (Star Experiment)  
DX Heaters: No indications that any fired.  
Main Magnet Power Status: Mains had just approached Top Energy Store when tripping.  
BDMC = 4308.38 amps, BQMC = 4008.88 amps, b-dmain-ps = Current Monitor

***Technical Notes / Sequence of Events:*** There was no indication of a power supply at fault prior to the quench. A blue quench link trip was caused by the 6b-qd1-quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2\_VT. The beam permit tripped .019 sec. before the quench link. There was a real magnet quench at b5q2. There was high beam loss at b5-lm2.1. There are now 13 beam induced quenches for this run. *G Heppner*

***Physics Log:*** The BLM at b5-lm2.1 tripped the link after the QLI. The per bunch intensity was right around 4.5e9 in both Rings, so we'll have to drop it down further. -JPJ

QLI Recovery TAPE Start: 01:08:28      Link Recovered Time: 01:17:07 **User invoked cancel.**

After initial turn on for the supplies, which all appeared to turn on, after the wait time and the check began, TAPE paused due to Standby Error b2-dh0-ps.

***Quench Analysis: Beam Induced Quench #013***  
***(Counter = Beam Induced)***

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

**Friday-January 28, 2005: PR-035, Blue Quench: File# = 1106892939**

Permit ID: **6b-ps1**      Timestamp: **01:15:36 +3514265**      Beam Permit Fail Timestamp: **01:15:36 +3514295**

QPAControl / Timing Resolver: QP10-R6BD3-b6-dh0-qp, no faults indicated.

Quench Detector(s) Trip: No indications, all systems running.

5 Minute: Quench Delay File: All systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

DX Heaters: No indications that any fired.

Main Magnet Power Status: Park Current.

**Technical Notes / Sequence of Events:** This blue qli was caused by b6-dh0-ps or b6-dh0-qpa. The timing resolver picked this p.s. qpa combination out. We will check the p.s. and qpa signal cables during the next maintenance day because there were no faults that showed up on either one. This problem could be due to one of these cables being loose or a bad connection. It happened after TAPE tried turning on the p.s.'s. I don't think this problem is due to loose resistors on the soft start circuit because an error fault would show up. The other reason I don't believe it is those resistors is that we soldered all of those resistors so none are loose now. We will check these resistors anyway during the next maintenance day. If the problem returns tonight just call me back and I will have CAS look at it. -Don Bruno

QLI Recovery TAPE Start: **01:22:00**      Link Recovered Time: **01:30:09**      Estimated Down Time: **14 minutes**

**Quench Analysis: b6-dh0-ps**

**(Counter = IR Supplies)**

**Friday-January 28, 2005: PR-036, Blue Quench: File# = 1106922852**

Permit ID: **10a-ps3.A**      Timestamp: **09:34:12 +701175**      Beam Permit Fail Timestamp: **09:34:12 +635123**

QPAControl / Timing Resolver:

Quench Detector(s) Trip: 10a-qd1, B10QFQ4\_6VT, Int. Tq -25

5 Minute: Quench Delay File: 10a-qd1, B10QFQ4\_6VT

Beam Loss Monitors (Rads/Hr): High losses in sector 10 beyond the Beam Dumps:

b10-lm4 = 4969.43, g10-lm5 = 4619.11, g10-lm6 = 4738.08, g10-lm7 = 4727.77

g10-lm8 = 3810.43, g10-lm12 = 4858.79, g10-lm20 = 5149.20

DX Heaters: No indications that any fired.

Main Magnet Power Status: Store Energy, b-dmain-ps, Current Monitor.

**Technical Notes / Sequence of Events:**

There was no indication of a power supply at fault prior to the quench. A blue quench link trip was caused by the 10a-qd1-quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4\_6VT. The beam permit tripped .066 sec. before the quench link. There was a real magnet quench at b10q4. There was high beam loss at b10-lm4. There are now 14 beam induced quenches for this run. *G Heppner*

*Physics Log:* 4a-bsyn RF Blue Accel input dropped first. J. Morris is revising the script that checks the permits... -gjm

With the loss of RF, the dump kicker may have lost its timing with the abort gap. -gjm

RF dropped out, and we QLI'ed. J. Butler investigating the Blue RF. -JLN

QLI Recovery TAPE Start: **10:20:50**      Link Recovered Time: **10:30:07**      Estimated Down Time: **56 minutes**

**Quench Analysis: Beam Induced Quench #014**

**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Friday-January 28, 2005: PR-037, Blue Quench: File# = 1106928363***

Permit ID: 2b-ps1      Timestamp: 11:06:00 +3703589      Beam Permit Fail Timestamp: 11:00:36 +3960932

QPAControl / Timing Resolver: No faults indicated, b-QD first to alarm.

Quench Detector(s) Trip: 2b-qd1, B1QFQ2\_VT, Int. 5, Tq -24

5 Minute: Quench Delay File: None indicated, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

DX Heaters: No indications that any fired.

Main Magnet Power Status: Ramping to LastStone, tripping at: BDMC = 760.02 amps, BQMC = 721.34 amps

**Technical Notes / Sequence of Events:** It looks like b2-q6-ps caused this blue QLI. We thought we fixed this supply the last maintenance day but the problem has returned. I asked MCR to put the p.s. into the OFF state for 5 minutes and try a ramp and we will see how it looks on the Snapramp. If that does not fix it we will have to probably swap a card out. -Don Bruno

QLI Recovery TAPE Start: 11:27:45      Link Recovered Time: 11:39:20      Estimated Down Time: 23 minutes

**Quench Analysis: b2-q6-ps Oscillations during the Up ramp at 2 amps.**  
**(Counter = IR Supplies)**

***Friday-January 28, 2005: PR-038, Blue Quench: File# = 1106931002***

Permit ID: 2b-ps1      Timestamp: 11:50:00 +2947458      Beam Permit Fail Timestamp: 11:50:00 +2947487

QPAControl / Timing Resolver: No faults indicated, b-QD first to alarm.

Quench Detector(s) Trip: 2b-qd1, B1QFQ2\_VT, Int. 5, Tq -24

5 Minute: Quench Delay File: None indicated, all systems running.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

DX Heaters: No indications that any fired.

Main Magnet Power Status: Ramping to LastStone, tripping at: BDMC = 969.10 amps, BQMC = 918.49 amps

**Technical Notes / Sequence of Events:** We are going to work on b2-q6, it brought the link down again. We must lock out the blue quad mains first. It seems like some data is missing from the Postmortem for b2-q6 on this trip. -Don Bruno

We replaced the 3-channel isolation amplifier board for b2-q6-ps. The hysteresis ramp now looks good for b2-q6-ps. -Don Bruno & Gregg Heppner

QLI Recovery TAPE Start: 13:02:23      Link Recovered Time: 13:10:55      Estimated Down Time: 82 minutes

**Quench Analysis: b2-q6-ps, replaced 3-Channel Isolation Board**  
**(Counter = IR Supplies)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Saturday-January 29, 2005: PR-039, Yellow Quench: File# = 1107023915***

Permit ID: 8b-ps1      Timestamp: 13:38:32 +3431526      Beam Permit Fail Timestamp: 13:38:32 +3360013

QPAControl / Timing Resolver: No Faults indicated, Yellow Quench Detector went first.

Quench Detector(s) Trip: 8b-qd2, Y8QFQ2\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr):

High: y8-lm2.1 = T-8 sec, spike to 3529.83, T-7 sec, 980.12 with a steady rise to 1877.03

Moderate: g8-lm1 = T-8 sec, spikes to 718.34, T-7 sec, 199.08 with a steadily rise to 396.53

High: b8-lm2.1 = T-8 sec, Spikes to 2849.77, T-7 sec, 739.24 then steadily rise to 1508.70

Main Magnet Power Status: Store Energy, YDMC = 4309.08 amps, YQMC = 4017.33 amp.

Other: y-qmain-ps, Current Monitor

**Technical Notes / Sequence of Events:** cfe-7b-ps1 is down, in the Pink Zone and required a reset using FIT.

There were no problems with any power supply prior to the quench. A yellow quench link trip was caused by the 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2\_VT. The beam permit tripped .071 sec. before the quench link. There was a real magnet quench at y8q2. There was high beam loss at y8-lm2.1. There are now 15 beam induced quenches for this run. *G Heppner*

QLI Recovery TAPE Start: 13:55:25      Link Recovered Time: 14:16:12      Estimated Down Time: 37 minutes

**Quench Analysis: Beam Induced Quench #015**

**(Counter = Beam Induced)**

***Saturday-January 29, 2005: PR-040, Yellow Quench: File# = 1107029562***

Permit ID: 8b-ps1      Timestamp: 15:12:40 +2266577      Beam Permit Fail Timestamp: 15:12:40 +2209815

QPAControl / Timing Resolver: No Faults indicated, Yellow Quench Detector went first.

Quench Detector(s) Trip: 8b-qd2, Y8QFQ2\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr):

Moderate: y8-lm0 = a four second wide pulse averaging 472.85

Moderate: g8-lm1 = a four second wide pulse averaging 545.23

High: y8-lm2.1 = a four second wide pulse averaging 2587.79

High: b8-lm2.1 = a four second wide pulse averaging 2051.45

Main Magnet Power Status: Store Energy, YDMC = 4309.08 amps, YQMC = 4017.33 amp.

Other: y-qmain-ps, Current Monitor

**Technical Notes / Sequence of Events:**

There was no indication of a power supply at fault prior to the quench. A yellow quench link trip was caused by the 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2\_VT. The beam permit tripped .057 sec. before the quench link. There was a real magnet quench at y8q2. There was high beam loss at y8-lm2.1. There are now 16 beam induced quenches for this run. *G Heppner*

*Physics Log:* 15:23: It seems both ramps were lost soon after cogging presumably due to beam-beam effect on yellow. There was much less loss after cogging in ramp 6025 but the yellow intensity was also lower. Maybe yellow tunes were better for that ramp. The only other thing to do is lower the intensity. -Thomas

15:25: We spoke with Fulvia, and she suggested that we lower the intensity to an average of 4.4e9 per bunch. -team d

QLI Recovery TAPE Start: 15:24:04      Link Recovered Time: 15:33:06      Estimated Down Time: 20 minutes

**Quench Analysis: Beam Induced Quench #016**

**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of January 2005***

***Saturday-January 29, 2005: PR-041, Yellow Quench: File# = 1107037760***

Permit ID: 8b-ps1      Timestamp: 17:29:20 +630171      Beam Permit Fail Timestamp: 17:29:20 +580059

QPAControl / Timing Resolver: No Faults indicated, Yellow Quench Detector went first.

Quench Detector(s) Trip: 8b-qd2, Y8QFQ2\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2\_VT

Beam Loss Monitors (Rads/Hr):

Moderate: y8-lm0 = average of 137 for the 9 sec, starting at T-1 sec, Peak value of 1498.55

Moderate: g8-lm1 = average of 140 for the 9 sec, at T-1 sec, Peak value of 1710.89

High: y8-lm2.1 = average of 681 for the 9 sec, at T-1 sec, Peak value of 8352.85

High: b8-lm2.1 = average of 531 for the 9 sec, at T-1 sec, Peak value of 6676.49

Main Magnet Power Status: Store Energy, YDMC = 4309.08 amps, YQMC = 4017.33 amp.

Other: y-qmain-ps, Current Monitor

**Technical Notes / Sequence of Events:**

There was no indication of a power supply at fault prior to the quench. A yellow quench link trip was caused by the 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2\_VT. The beam permit tripped .050 sec. before the quench link. There was a real magnet quench at y8q2. There was high beam loss at y8-lm2.1. There are now 17 beam induced quenches for this run. *G Heppner*

QLI Recovery TAPE Start: 17:43:37      Link Recovered Time: 17:52:50      Estimated Down Time: 24 minutes

**Quench Analysis: Beam Induced Quench #017**

**(Counter = Beam Induced)**